

THE ZOOLOGIST.

THIRD SERIES.

VOL. III.]

FEBRUARY, 1879.

[No. 26.]

ON THE AUTUMN MIGRATION OF BIRDS IN 1878.

BY JOHN CORDEAUX.

THE autumn migration of 1878 has in some respects been remarkable, and a striking contrast to that of the preceding year. In 1877-78 a very mild autumn and winter over the North of Europe, with but few intervals, and these of short duration, of severe weather, gave a prolonged and desultory character to the great southern movement. Birds came in great rushes and at long intervals, corresponding with short and very marked changes of temperature. Thus migration was prolonged throughout the winter, and indeed, from Mr. Gätke's observations in Heligoland, did not absolutely cease till the end of February, just before the return journey commenced.

The migration of the past autumn, when once began, proceeded with great rapidity and without interruption. All the returns I have obtained, both from our coast and from the eastern side of the North Sea, show that this was the case, day by day wave after wave of immigrants sweeping southward, and in such immense numbers that we may fairly suppose long ere Christmas, 1878, the dreary winter-bound north was fairly denuded of birds.

I will not go so far as to say that the character of the coming season may be always accurately predicted by the movement of our autumn migrants. The passage of birds from the north to the south is an annual and normal phenomenon; no matter what the weather is, in September, October and November the birds come; whether we see them or not depends on circumstances of wind and weather, into which it is not necessary at present to

enter. I will, however, go so far as to say that, from the character of the migration each year, when the data are sufficiently numerous and reliable, a tolerably correct forecast may be made as to the probable character of the coming winter, whether it is to be open or severe. This autumn the indications were all in favour of a winter of unusual severity.

Independently of my own notes, observations have been received from Spurn Point, Flamborough Head, the Whitby-lights, the Tees-mouth, as well as other localities on the north-east coast; also some very interesting notes from Mr. Gätke from his outpost on that old red crag in the North Sea. I will take this opportunity of thanking my correspondents in the various lighthouses and lightships for the kind assistance they have given me in these enquiries, and for the careful manner in which the papers sent them in the early autumn have been filled up. I am also greatly indebted to Mr. C. Donald Thompson, of Seaton Carew, who has spared no pains to obtain information on the Durham coast.

In the papers sent out in the autumn information was requested under the following heads:—(1) Date; (2) Number of birds and species; (3) Time when seen, or hour of striking the lantern; (4) Wind, direction and force; (5) Weather, fine or rain, clear or fog; (6) Other remarks, how many killed against glass.

Commencing with the larger Raptores, few, compared with what is often the case, have been noted. A pair of Kites seen by myself beating across the Humber marshes late in August. Two or three Buzzards in October, an immature Osprey, shot at Tathwell, near Louth, on October 11th, and a Honey Buzzard shot near Market Weighton, in Yorkshire, exhaust the list.

Short-eared Owls have likewise been very scarce. One at Spurn lighthouse, October 17th. Another seen near the Whitby light on the 20th. One passed the Tees buoy-light on the 14th, and two at Seaton on the following day, with some few others on the Lincolnshire coast. They appear to have arrived generally during the third week in October. Wind S.W. and calm.

A male Great Grey Shrike was shot at Beswick, near Beverley, on November 4th, and this is the only example I have heard of as procured anywhere on the east coast.

The immigration of the *Turdidæ* has been incessant during October, November, and the first ten days of December; immense

numbers of Thrushes, Blackbirds, Redwings, Fieldfares* reaching our east coast; and a few Ring Ouzels, as usual, coming with the Blackbirds. October 15th, Thrushes and Blackbirds from 1.40 to 3.30 A.M., flying past light at Flamborough. On the 16th, Thrushes and Chaffinches from 1.20 till 3 A.M. On the 17th, a great many Blackbirds, Thrushes and Chaffinches from 1.25 to 5.40 A.M.; wind S. to S.E., stiff, overcast. I saw the first flock of Fieldfares in North-East Lincolnshire on the 23rd. Mr. W. E. Clarke, of Leeds, who was at Spurn at the time, informs me that a considerable immigration of Fieldfares took place on the 27th and 28th, and he also observed two Ring Ouzels come in from the sea. On November 4th, 2.40 A.M., wind N.W., overcast and misty, blowing half-a-gale, six Fieldfares struck the glass of the Flamborough lantern, two suffering self-immolation. On the 8th, 9th, 10th and 11th December a great many Thrushes, Blackbirds, Fieldfares, Snow Buntings and Linnets, flying from S.E. to N.W., passed the Tees floating buoy-lightship; wind N. to E., with snow. This was the final rush from the north with the commencement of the frost and snow. From every station last autumn I find, compared with the other *Turdidæ*, a comparative scarcity of Fieldfares; the only exception appears to be North-East Lincolnshire, where we have had much above an average, the greater part, as ten to one, being young birds of the year.

Redbreasts were not nearly so numerous as during the previous autumn. Gold-crested Wrens were first seen at Spurn on October 16th, "S.E., gloomy, several through day." There was a large arrival about this date on the Holderness† and North Lincolnshire coast. On the 18th, S.E., showers, many brown Wrens were seen near the Spurn Lighthouse by Mr. Watson, the Principal.

During the last fortnight in October I was much struck by the unusual number of Great Tits, *Parus major*, in our gardens and hedgerows, also by a most extraordinary mustering of the common Blue Tit, *Parus cæruleus*—these latter in flocks in every hedgerow. My attention was also drawn to their unusual number by a friend living in an adjoining parish. I could only account for this most unprecedented gathering by supposing they were

* The species are placed in order in proportion to their relative numbers, and also some Pigeons, *Columba palumbus*.

† Mr. P. Lawton, of Easington, near Spurn Point, says, "I think never more Gold-crested Wrens"; also, "a very large quantity of Common Wrens."

migrants either from the North of England or from Europe. They were particularly numerous after the heavy gale on the night of October 30th, along with Common Wrens, Coal-Tits and Goldcrests. Subsequently having received Mr. Gätke's notes, showing the astounding numbers of both species which passed over Heligoland this autumn, there is now no reason to doubt those seen in North-East Lincolnshire in October were immigrants, and not the mere shifting of local birds from one home district to another.

There is no genus better qualified to brave the winters of high northern latitudes than the Tits. Under the cover of dense pine forests they find not only warmth and shelter, but an unfailing supply of insect-food. How intense, then, must have been the outburst of winter in the north to drive all these forest-haunting birds southward in such extraordinary numbers.

A flock of Waxwings were seen in the Denes, near Castle Eden in October, and several, I am informed, were shot.

From the first week in October to the middle of December Larks kept coming in. Always numerous,* they were last autumn especially so. At Spurn, on the 5th October, they were passing all day and night; cloudy, wind S.; twelve struck the light. At Spurn also, on the night of the 7th, large flocks of Linnets and Chaffinches, eighteen striking the lantern; and on the 12th, Starlings, fifteen striking the lantern. Also from the Tees-mouth, October 7th, "great many Larks coming from the N., flying S."

Snow Buntings were first seen at Spurn on November 7th; wind N.N.W., half-a-gale, showery. At Flamborough, on the 18th October, "some mixed with Larks." Tees-mouth, on the 5th November, "flock of twenty;" also on the 10th, "flocks flying S.W., dead to windward;" as my correspondent notes, "wind S.W., the fore part of the day a gale; middle part moderate." In the Cotes marshes I saw the first Snow Bunting on the 1st November; large flocks on the 9th and 10th. There were large flocks at Easington in the middle of November; and, on the 6th of that month, these birds crossed Heligoland in "astounding numbers." It will thus be seen that the migration of the Snow Bunting was very generally carried on in the first fortnight in November.

* Larks and Starlings invariably figure largely in the lighthouse returns.

I noticed gatherings, numbering sometimes hundreds, of Tree Sparrows during the last half of October. On the outbreak of the severe weather in December many came into the farm and stack-yards, concerting with *Passer domesticus*, with whom they appear to live on the best of terms.

As usual, immense numbers of Starlings have come in during the autumn; on the 17th, 18th and 19th of October, at Whitby (High Lights), wind S.E., all day passing the Lighthouse.

The *Corvidæ* appear to increase every year; they belong to a race that is evidently able to increase and prosper, at the expense, too, of the least-favoured and protected races. Mr. Gätke, in a recent letter, speaking of *Corvus cornix*, says, "Of the legions that pass over in October and November, you can form not a shade of an idea of their numbers, and considering that all these ugly brutes have been feeding on the plunder of all the poor little birds' nests, it is not to be wondered at that these latter decrease, but rather a miracle that any survived. * * * With all my heart I wish that your gamekeepers might succeed in strichnining nine-tenths of them."*

On November 7th I noted Daws in small parties, and Rooks—eight to ten and twenty—coming in, flying from N.E. to S.W. This continued from 10.30 A.M. to 1 P.M.; on the morning of the 9th, also, Rooks still coming in from the sea. At Flamborough, on October 20th, "Rooks, Jackdaws, and some Dun Crows flying towards south all day; S.S.E., overcast and misty." *Corvus cornix*, during the last half of October and in November, is noted at various stations. The Starling, Hooded Crow, Rook and Daw are each year steadily increasing as immigrants from the north.

A Great Spotted Woodpecker was shot near Withernsea about October 29th. Kingfishers have been very common in our marshes after August. A Fern Owl, a female, was shot near Easington on October 23rd; the stomach was filled with small Coleoptera. Immense flocks of Wood Pigeons appeared in November in North Lincolnshire, visiting by thousands the turnip-fields and the young clover plants. Wood Pigeons, I have observed, invariably fly very high when migrating.

Before the outbreak of the severe weather, commencing with December 8th, enormous flocks of Golden Plover and Lapwing

* I quite agree with Mr. Gätke's remarks, but would extend the remedy to the whole race of egg-sucking *Corvidæ*.

frequented the semi-flooded marshes; within a few days after the breaking out of the frost and snow all had departed, and not a solitary bird of either species was to be seen. The Wood Sandpiper was shot at Spurn in August, and a Grey Phalarope, a male, at Filey on November 9th.

The first Woodcock was seen at Spurn on October 1st; wind N.N.W., drizzly. Several arrived on the 17th, and again on the 30th. On November 2nd a Woodcock struck the low light at Spurn at 3 A.M.; wind N.N.W., rain. On the 5th two Woodcocks passed the Tees floating-light,—wind N.E. by E., strong breeze,—and again on the 8th and 20th. Great numbers appear to have crossed Heligoland during the last week in November.

Large flocks of waders, as Curlews, Dunlins, Grey Plovers, and Redshanks appeared on our coast as early as the middle of August. Snipe during the autumn have been abundant. Jack Snipe scarce; in proportion to the former as one to ten or twelve. Amongst the immigrants which arrived in our east-coast marshes early in November were several Water Rails.

The return from the Tees buoy-lightship throughout the whole of October and November shows a large arrival of the *Anatidæ* on the coast, comprising Wigeon, Mallard, Teal, Golden-eye, Sheldrake (twenty-five to twenty-seven in a flock), Shovellers, Scoters, and Wild Geese; also some Divers. The same has been the case in the Humber, where we have had in the later autumn an extraordinary arrival of various ducks, geese, and some swans. After the heavy gale from the N.W. on the night of October 30th, several Little Auks were driven on the coast and inland. At this time one was picked up alive in the town of Grimsby.

Mr. Gätke has supplied me with the following autumn notes from his outpost in Heligoland—that storm-swept crag in the North Sea. They are so remarkable that I give them in full:—

“October 1st. S. and S.E. During night great numbers of migrants passing Lighthouse. *Turdus torquatus* and *musicus*, and of *iliacus* a great many (too early); *Anthus Richardi*, *pratensis* and *rupestris*; *Sylvia phœnicurus*, *trochilus*, *rufa*, and one *locustella*; *Falco peregrinus*, *asalon* and *nisus*.

2nd. N.W. and N.N.W., windy, showers. *Phylloscopus superciliosus*, one in my garden; *Corvus cornix*, great multitudes; also of *Sturnus vulgaris* (old birds).

3rd. S.W.—W. *Sturnus*, great many; *Fringilla cœlebs*, *montifringilla*, *cannabina* and *linaria*; *Parus major* and *cæruleus*; *Reguli*; *Emberiza lapponicus*.

October 4th. S.W., windy. Nothing.

5th. S.E., clear. During night lots of Larks, Thrushes, Plovers and Peewits. *Anthus Richardi*, one shot; *Alauda alpestris*; *Parus caruleus*, a great many; *P. major*, less.

6th. S.E., strong. *Parus caruleus*, a great many; *Sylvia rufa* and *trochilus*; *Alauda alpestris*.

7th. S.—S.W.—W., warm and still. *Corvus cornix*, a great many—tens of thousands; *Parus caruleus*, astounding numbers; *P. major*, many; *Sturnus vulgaris*, a great many old birds; all the *Fringillidæ*; *Accentor modularis*; *Turdus musicus*, pretty numerous; *T. iliacus* and *merula*, less; *Sylvia rubecula*, many; *S. rufa*, less; *Anthus pratensis* and *rupestris*, pretty many; Woodcocks, some.

8th. S.S.E.—S., clear, windy. The same as the day before; Starlings, many thousands; *Parus caudatus*, fifteen to twenty; *Hirundo rustica*, a great many young birds during the afternoon.

9th. W. *Phylloscopus superciliosus*, one seen during the last four days, probably the same. *Emberiza pusilla* in my garden.

10th, 11th, 12th. S.W.—W.—N.W. *Sterna Dougallii*, a young bird; scarcely anything besides.

13th. W.—S.W., clear, fine. *Muscicapa parva*, shot one in my garden; Hooded Crows and Starlings by tens of thousands; *Turdus merula*, *musicus* and *iliacus*, not many; *Fringillidæ* and *Anthidæ*.

14th. Calm, later S.E.—E. and E. by N., clear and warm. *Corvus cornix*, by thousands, high; Starlings, hundreds of thousands from 8 to 11 A.M., from 50 to 250 feet high, flying in circles, like Swallows catching insects on wing. I have never before seen this done by Starlings. *Alauda alpestris*, many; *Fringillidæ*, many; *F. coccothraustes*, one.

15th. E.S.E., strong. *Corvus cornix* and *Sturnus*, a great many; *Corvus monedula*, many; *Alauda arborea*; *Parus major* and *caruleus*.

16th till 20th. E. by S. The lower shattered clouds S.E., higher clouds (more solid) S., the highest W. by N. *Corvus cornix*, in great numbers, coming from N.E., and some northerly.

20th. Westerly wind. *Corvus cornix* and *Sturnus*, tens of thousands; nearly nothing else.

21st. E., fresh. *Anthus Richardi*, four; *Turdus merula*, *musicus* and *iliacus*, few; Woodcock, daily some.

22nd to 23rd. S.W., rain. Nothing whatever.

24th till 30th, stormy. *Phylloscopus superciliosus*, one seen in trees at steps; *Parus ater*, one.

30th. W. and N.W., stormy. *Emberiza pusilla*, one; *Corvus cornix* and *Sturnus*, many; *Alauda alpestris*, pretty many; *Fringilla montium*, *chloris* and *montifringilla*, great numbers; *Regulus flavicapillus*, pretty large numbers.

31st. In the morning E., changing all round, but very quiet. *Falco gyrfalco*, one; *Corvus cornix* and *Sturnus*, many thousands; *Alauda alpestris*, a great many; *Sylvia rubecula* and *atricapilla*, many; *Parus major* and *cæruleus*, many; *Scolopax* and *Turdus*, not many.

November 1st, 2nd and 3rd. N.W., high wind. *Corvus cornix* and *Sturnus*, still thousands; *Scolopax* and *Turdus*, a few; *Regulus flavicapillus*, *Parus major* and *cæruleus*, many; *Falco peregrinus*, some; *F. gyrfalco*, one on the 3rd; *Emberiza nivalis* and *alpestris*, great numbers.

4th. N.E., cloudy. *Falco albicilla*, several; *Corvus cornix* and *Sturnus*, again thousands; all the *Fringillidæ*, and *Parus major* and *cæruleus*; *Emberiza nivalis*, many.

5th. N.N.E., rain, wind and hail. Nothing.

6th. S.E., rain, up to 12th. *Turdus varius*, stated to have been seen; *Turdus pilaris*, many; *Emberiza nivalis*, astounding numbers.

Storm from Nov. 8—10.

12th. S.—S.W.—W. *Parus caudatus*, four; *Regulus flavicapillus*, some after the wind, having blown from 9 to 10 during night.

15th. S.E., cloudy and windy. *Corvus cornix* and *Sturnus*, a few; *Parus cæruleus* and *caudatus* and *Regulus flavicapillus*, some.

16th and 17th. Storm from the S.E. and S.

17th, wind quiet, East, dark. *Charadrius squatarola*, at 9 A.M. thousands on thousands overhead, passing over; *Scolopax gallinago*, many.

18th, 19th. E., quiet. *Alauda alpestris*, flights of twenty; *Emberiza nivalis*, many; *Corvus cornix* and *Sturnus*, in flights of from twenty to fifty.

20th, 21st. S.S.E., quiet. *Alauda alpestris*, *Emberiza nivalis*, *Parus cæruleus* and *major*, some; *Fringillidæ*, every day, more or less; *Sylvia rubecula*, daily.

21st and 22nd, during night S. *Turdus*, *Vanellus*, *Charadrius auratus*, *Scolopax rusticola* and *gallinago*, passing overhead in numbers.

25th. S., fog, quiet. A few of the above.

26th. S.S.W., windy and raining. During night, passing overhead:—*Alauda arvensis*, *Emberiza nivalis*, *Turdus merula*, *pilaris* and *iliacus*, *Numenius* (great many), *Charadrius auratus*, *Tringa alpina*, *Scolopax gallinago*, Herons and lots of various unknown, all in great numbers. Several Woodcocks caught during night near Lighthouse.

27th. Quiet, foggy; evening N.E. Woodcocks, shot about a score. During night again all the above overhead, passing over.

28th. N.E. *Alauda alpestris* and *Fringilla montium*. During night again a great host of all waders, &c., passing overhead.

29th, 30th. N.E. *Pyrrhula vulgaris*, three, some caught; have not been seen here for a great many years. *Fringilla carduelis*, some; Woodcocks, some. During night again great numbers overhead."

The following notes have been sent by correspondents. I give them as nearly as possible in their own words:—

Tees 5th Buoy-lightship, June 9th, 1878. — “Two Sheldrakes with sixteen young ones with them came close to the light; they appeared to have been hatched that morning, as they were very small.”

The same, July 31st, 1878.—“Light breeze from the N.E. and cloudy. Observed a great many Sea Swallows [*Sterna minuta*] in the Tees this day; some of them have black heads—some are as small as Larks. There was a ‘Chaser’ [probably *Lestris parasiticus*] with them; it is a dark brown bird. When the ‘Swallows’ caught a sprat the Chaser would fly after them and take it from them; they never fish themselves. Seamen call them ‘Boatswains.’”

January, 1877.—“About the middle of this month a very fine Cormorant, with top-knot, came to the Light, which I caught and kept all night. Next morning I let it out, and it flew away; but at 4 P.M. it returned, and I threw it some small fish, which it seemed to enjoy; it roosted on the Light. After that its visits became regular, and it got very tame. I did not take particular notice how many weeks, but for some considerable time it kept this practice up, when all at once it disappeared.”

March 30th, 1878.—“Strong wind from the W.N.W. to N.E., with snow storms and a heavy sea running. I observed a large flock of Cormorants come into the Tees at 4 P.M.; one came to the Light and roosted all night, and at 7 A.M. left; however, at 4 P.M. it returned, and as it roosts on the same place and appears very tame and quite at home, I concluded it was the same bird which came in 1877. I feed it with small fish; it does not like strangers, and when they come to the Light it leaves. The end of this poor bird I heard in July; it was shot on Seaton Snook by a puddler or some other gunner.”

It is worth remarking that I got a young Chiffchaff on the 10th December. It flew into a friend's room on the 7th, and killed itself against the glass. This is a very late occurrence for this bird in North Lincolnshire.

An interesting occurrence at Spurn was a small flock of Siskins, seen by Mr. William E. Clarke, of Leeds. They were feeding by the roadside between Easington and Spurn, on the seed-bearing plants, and were so tame as to allow him to approach within a few feet.

NOTES FROM AN ARCTIC JOURNAL.

By H. W. FEILDEN, F.G.S., C.M.Z.S.

(Continued from p. 24.)

After the sun left us at mid-day, which occurred on the 11th October, the twilight sensibly decreased day by day. On the 25th I noticed in my journal that at mid-day only a glow of pale amber showed in the south-east, against which the contour of the Greenland coast was just visible; the ice and hummocks in shade looked a dark purple, the flat floes white. Whilst walking, we came across the fresh tracks of a Lemming, which I followed; they crossed the ice-foot, out on to the pack, and the little animal had burrowed down through snow to a tidal-crack; its return footsteps could be traced to the land. Subsequently I daily observed traces of similar movements on the part of this rodent to the water, until it became too dark even to notice their tracks, which look like a pattern for linen embroidery, in the white snow.

On the 29th October Quartermaster Bury, when on watch, heard what he considered to be a pack of Wolves howling in the distance, and I have little doubt of the correctness of his report. Our indefatigable hunter, Dr. Moss, borrowed my snow-shoes and went some distance inland, but found no tracks of Wolves, though those of Hares were not uncommon. It must be remembered that one or two Hares when on the move will make an enormous number of tracks in snow in a few hours. Moss remarked that even if he had come across a Hare, it would have been too dark to shoot it.

From the end of October till the return of the sun in the following year, the notices in my journal which have any bearing on Natural History are so few and scattered that it is out of the question endeavouring to bring together a sequence of observations; but as the sole value of any such intermittent notices consists in the exactness of the record, I do not scruple to transfer, word for word, from my journal the few items which may be considered to bear on the subject:—

“October 31st.—Hauled up the net, containing a dog, which had been let down to the bottom of the fire-hole, a depth of ten fathoms; though it had only been in the water six days, the

flesh was nearly cleaned off the bones by the shrimps. Some hundreds of these crustaceans, chiefly *Anonyx nugax* and *Gammarus locusta*, came to the surface with the skeleton: exposed to a temperature of -15° F., they all died in two minutes, the temperature of the sea-water being $+28^{\circ}$ F.

November 1st.—Dr. Colan has been good enough to show me his monthly medical inspection report. Out of seventy souls on board, fifteen are under treatment for frost-bites and colds, the rest in excellent health.

2nd.—Considerable movement in the pack outside; the grinding together of the ice sounded like the roar of a great waterfall. In water taken from the fire-hole I detected a few minute copepoda. Noticed the fresh track of a Hare leading across the ice-foot and out on the pack. What can induce these animals and the Lemmings to leave the land, go to the edge of the tidal-cracks, and return to the shore, unless it be to obtain water?

4th.—A fresh breeze from S.S.E., the temperature has risen to zero; this sudden rise is most oppressive: I can honestly affirm that after a short walk, Egerton, Rawson and I were glad to throw ourselves down on the floe to rest and cool. Whilst working at the fire-hole this morning I noticed Bruin, a big Eskimo-dog, stagger whilst digging with his companions in the dirt-heap; he uttered a piercing yell, and started off in my direction with a half-paralyzed gait; his companions then set upon him, and worried and bit at him; I drove the savage brutes off with an ice-chisel; Bruin then fell into convulsions which lasted over five minutes; his four legs were contracted inwards, and jerked together outwards with great rapidity; foam exuded from his mouth, and a loud gurgling came from the throat; his eyes were open and fixed; gradually his legs stopped jerking: the beast remained quiet for about a minute, then rose to his feet, and ran round in circles head down; back somewhat arched; tail, which was only a stump, tucked between the legs; gait very unsteady. I had a lantern in my hand with which I had been examining the contents of the net from the fire-hole. The dog now ran round me in a circle; I changed my position five times and the dog always followed and circled round the light; in a few minutes the poor brute seemed to recover his faculties, gave a yell, and made off to a hummock, where he coiled himself up."

I have reproduced this circumstantial account from my journal because it was written down within a few minutes of the occurrence of the event, and because I was requested to make careful observations on this disease if we were so unfortunate as to meet with it. Otherwise under similar circumstances—namely, a pitch-dark day on a Polar floe, with an apparently rabid dog careering round—one might be tempted to kill the animal, which would have been a great mistake, for Bruin recovered, and next year took his place in the dog-team.

“Nov. 12th.—Only three of the Homing Pigeons brought from England are now alive, and these have been placed on the upper-deck, which is housed over with a felt awning; day and night lighted lamps are suspended in this part of the ship, so that, except for the extreme cold, it is the most cheerful spot we can find for these birds. A temperature of fifty to sixty degrees below the freezing-point does not appear to incommode them, for two of them are mating and seem quite happy, billing and cooing.

16th.—When I drew up the baited net from the fire-hole, it contained, along with other crustaceans, a dozen specimens of *Arcturus baffini*; the largest of these had the antennæ covered with young ones; there was also an annelid: all of these creatures died instantaneously when exposed to the air, the temperature of which at the time was -30° F. The difficulty of working with ungloved fingers in such a temperature is insuperable; frost-bite can only be kept off by thrusting the hands continually into the sea-water.

24th.—The two mated pigeons disappeared to-day, and the third was killed and hung up in the rigging to prevent its loss.

30th.—A small phosphorescent pleurobranch came up in the water from the fire-hole, the temperature of which was 28.2° F.

December 3rd.—There has been an extraordinary rise in the temperature to-day, coincident with a strong S.E. wind blowing up Robeson Channel: the maximum registered was $+35^{\circ}$ F. At 5.30 P.M., on a hummock elevated eighteen feet above the floe, the temperature registered $+28.2^{\circ}$ F., but during lulls of the wind it fell a degree; a foot from the surface of the hummock it registered $+26^{\circ}$ F., on the hummock itself $+19^{\circ}$ F.; a thermometer buried in a hole made with an augur two inches in the

ice + 11° F., at four inches + 8° F., and at eight inches + 3° F. The water in the fire-hole at a depth of eight feet was + 28.2° F. (the normal winter temperature). At 6 P. M., two thermometers taken simultaneously at the maintop, and four feet above the floe, gave + 24° F. for the higher, and + 21° F. for the lower level.

6th.—When out walking I heard a peculiar cry sounding from the hills; it might have been from one of our dogs chasing a Hare, but it differed from any note I have yet heard from them. It was a weird melancholy cry, and in all probability was that of a Wolf.

11th.—The moon very bright; at noon the heavens were unobscured by a single cloud. I could read a book (Darwin's 'Voyage of a Naturalist') with ease whilst walking on the floe. Cape Joseph Henry, distant twenty-five miles, was distinctly discernible. Aldrich, when travelling on the 25th September last, cut loose a bitch from his team which was constantly having fits, at a distance of some thirty miles from the ship. When Captain Markham was returning along the same route during the second week in October, this animal hung about his party, and though never approaching in the daytime, came to their tents at night, and picked up the scraps that were left out for her. She was observed on the 13th October, the night prior to Markham's sledge-parties arriving at the ship. To-night she came back and allowed Petersen to catch her. She was a mere skeleton. She did not seem shy with men, but would not consort with the other dogs. It seems probable that this animal, for the last two months, must have been stealthily visiting the neighbourhood of the ship at nights, and picking up offal; it is impossible that the products of the chase could have kept it alive. This appears to be an instance of the Eskimo-dog reverting to its wolfish origin.

22nd.—The moon disappeared below our horizon on the 19th, not to reappear till next year. It is a very joyous thought that the sun is on its way back to us. Captain Nares discovered the track of a small animal to-day on the floe, which can be nothing else but an Ermine. The temperature is — 40° F.

25th.—Very dark to-day at noon, I could not make out the letters on the title-page of 'Darwin's Voyage'; I could distinguish black and white, namely, a difference of colour between the print and the paper, but nothing more.

26th.—This has been a very dark day. At noon the title-page of my text book, 'Darwin's Voyage,' quite indistinguishable.

29th.—Distinctly lighter at noon to-day. People could be detected when moving, up to a distance of fifty paces.

30th.—We let Buchanan's water apparatus down the fire-hole to a depth of thirty-six feet; the temperature of the water was $+28.2^{\circ}$ F. For about a foot in depth from the surface of the fire-hole, even immediately after the ice has been removed, which is done every few hours, the water is found to be in a pasty semi-congealed state, and a person dipping a vessel by hand into this will dish up nothing but ice. We have, therefore, adopted the following simple arrangement to procure water:—To the bottom of a staff six or seven feet long a bottle, well corked, neck uppermost, is lashed; a string being attached to the cork, the staff and bottle being pushed perpendicularly down the fire-hole, the cork is withdrawn and the bottle fills. No time has to be lost in hurrying below deck with the bottle, for if allowed to freeze, which it does almost immediately, there is a liability of the bottle bursting. It will hardly be believed, what a difficult and painful task this daily procuring of sufficient water from the fire-hole for microscopic investigation has been for Dr. Moss and myself."

The new-year of 1876 was entered on under most favourable auspices; the health of the crew was in all respects satisfactory, and our frost-bitten comrades had nearly recovered. We certainly had every reason to be thankful and contented; our winter quarters, though completely exposed, and adopted more from necessity than selection, had so far proved safe and convenient. The ice that had formed inshore had now attained sufficient thickness to lead us to hope that, in the event of a gale moving our protecting wall of floe-bergs nearer the shore, the ship might rise on the newly-formed ice, and thus save herself from being cast on the land. This chance of being stranded was the evil we had most to dread.

A period of two months had to elapse before the reappearance of the sun, and up to that date I had very little hope of being able to effect anything in my special branch. It must not be supposed, however, that time ever hung heavily; meteorological, tidal, and other physical observations had to be constantly attended to; a certain number of hours outdoor exercise was

insisted on; school, theatricals, and lectures occupied the evenings; whilst the undeviating routine and discipline of a man-of-war insured order and comfort.

During the periods that the moon was above the horizon, owing to the usually extreme dryness of the atmosphere, she shone with greater brilliancy than we are accustomed to, in our humid climate; we were at those times able to extend our walks and see for miles around us, and though the prospect was marvellously weird and dreary, and the scene of solitude at times almost oppressive, yet there was a grandeur in the snow-clad hills and in the great frozen sea which I cannot hope to describe.

The following extracts from my journal are inserted to show that, as far as our observations go, we have no reason to suppose that any of the animals that winter in Grinnell Land hibernate. Until the autumnal darkness rendered it impossible to observe any more tracks in the snow, I noticed that Hares and Lemmings were on the move; and again in the commencement of the year, just so soon as the increasing twilight enabled us to extend our wanderings, and during the coldest periods of the Arctic year, we likewise found these animals roaming about.

"February 8th.—A beautiful calm day, the moon nearly at her full, temperature — 50° ; walked to the top of the flag-staff hill; Cape Joseph Henry, a distance of twenty-five miles, showed very distinctly; continued my walk to Cape Sheridan. The planet Venus was shining brightly in the arc of twilight that showed in the south, in which same direction the other stars were invisible. Egerton came across a Hare's track to-day, the first seen this year.

10th.—Leaving the ship at meridian, with Egerton, we walked to the southward, and then ascended to the plateau, by its eastern face, as the snow appeared to be heavily drifted in the ravine. Parts of the upland were bared or only lightly drifted over with snow, but without much alteration of our intended course we were able to travel over hard snow at a very brisk pace. We reached in two hours a point overlooking Robeson Channel, mid-way between Cape Rawson and the next headland to the south. We estimated that we were four and a half miles from the ship. From this point we could see the Greenland coast distinctly: there was not a pool of water visible in Robeson

Channel; a light mist hung over portions of it, but not sufficiently dense to hide the floes and hummocks from our view. We found no trace of life on the uplands, but nearer the ship crossed a Hare's track, and also observed some small circular holes in the snow about the size of a penny-piece, at the edges of which the snow from inside had been thrown up in small particles; no foot-prints were to be seen on the surface, but the Lemmings were thus early on the move beneath the snow, no doubt peering out of their siphuncles, to see how the sun was getting along. Thus we see that with the first glimmer of dawn these little animals are awake, even supposing that they hybernate, but if they do, it cannot be ascribed to cold, for to-day the thermometer registered — 54° or eighty-six degrees below the freezing-point. We ran home very briskly, reaching the ship before 4 P.M.; our under-clothing was soaking with perspiration, but Egerton's nose and my left cheek were slightly frost-bitten.

February 11th.—Came across the tracks of a Hare which had been feeding on the buds of *Saxifraga oppositifolia*. This plant I often find in spots bared of snow by the wind, and consequently exposed to the low temperature of fifty and sixty degrees below zero; yet at the extremity of each stalk, inside of the russet-brown hair-fringed leaves, a green bud is to be found, which even the intensity of cold prevailing here fails to wither. Without this plant the Hares and Lemmings could not exist.

14th.—Whilst out walking put up a Hare, which escaped. The temperature being — 50° , I had my gun slung on my shoulder, as even through thick gloves the heat of the hands is quickly abstracted by contact with metal. This animal had been occupying a burrow in a snow-bank.

16th.—The view from Lookout Hill was very pleasing; towards the south there was a warm glow of salmon-colour at mid-day. Around the cairn were many tracks of an Ermine. I exposed my bare hands for two or three minutes, whilst grubbing up plants, and in that time they became so stiff from cold that I could not close my fingers: the temperature was ninety degrees below freezing.

20th.—The armourer shot a Hare, and Mr. Goode, the boat-swain brought me in a Lemming in its winter-suit of white."

By the end of February, Lemmings were often observed by us running on the surface of the snow. When disturbed they buried

themselves with great rapidity. At this season the colour of the fur is greyish white, nearly pure white at the tips, but darkening to mouse-brown nearer the skin.

On the 2nd March, after an absence of one hundred and forty-two days, the upper disc of the sun was visible from the mizen-rigging of the ship, and at mid-day, on ascending Lookout Hill, our eyes were gladdened with a full view of the resplendent orb of day. The sun only remained for a few seconds above our horizon, but that short appearance made us feel as if we had all taken a new lease of life. During the first two weeks of March we experienced most intensely cold weather. On the 4th, our corrected thermometers registered -73° , or 105° below the freezing-point. The weather at that time being calm I had a couple of hours' walk, and ascended Lookout Hill, from whence a good view of the sun was obtainable at mid-day. Its entire sphere, a glorious golden shield, now rose above the southern highlands, and to our benighted eyes shone with a lustre that could only be appreciated by those who, like ourselves, had passed a long five months wearying for its return. During this intense cold, we did not whilst taking exercise feel any bad effects: certainly we left the ship warm and well clad, and were not exposed sufficiently long to lower the vital energy, but in ascending a hill, some six hundred feet high, I experienced no difficulty in breathing or any other annoyance, though perhaps my respiration was a trifle quicker than usual. Dr. Moss was at the same time out with his gun, rambling over the hills for four hours, and found fresh tracks of a Hare. Immediately on his return to the ship I obtained his sub-lingual temperature, which registered $99\frac{1}{2}^{\circ}$. Though of necessity we were all obliged daily to expose large surfaces of our body unprotected for a few minutes, yet in no instance were any frost-bites incurred or any inconveniences suffered. Inside of the ship, or in nautical parlance "between decks," we had to endure great discomfort from damp. The moisture in the air, from our breath, from our food and raiment, condensed on the beams, bulkheads, and sides of the ship, in fact everywhere not immediately adjacent to the stoves. Our sleeping cabins which were arranged along the sides of the ship formed condensers, the heated air of the ward-room passed into them, and the moisture deposited itself either in the form of ice, on the side exposed to the cold outside air, or in water which dripped

continually from the ceiling. Bedding, clothes, and books became saturated, and it was impossible to keep iron from rusting. To obviate this inconvenience in my cabin, I removed the dead-light in the ceiling and replaced it with a wooden shutter, through which was passed a piece of half-inch india-rubber tubing, which was then carried under the snow on deck to a convenient aperture. This pipe became a "downtake" for the outside air, and in a few minutes reduced the temperature of the cabin below the freezing-point. The moisture in the air either precipitated itself in the form of lovely snow crystals or formed solid ice, which was removed from the bulkheads. By tying a knot on the flexible tubing the down-draught of air could be stopped and the temperature raised. Until this plan was adopted it was found almost impossible to work with a microscope owing to the annoyance occasioned by the persistent drip.

(To be continued.)

OCCASIONAL NOTES.

HABITS OF THE KITE AS OBSERVED IN SCOTLAND.—On the 3rd October I clearly observed a Kite flying over a wood within a few miles of Brighton. A farmer, on whose land I was shooting at the time, told me that when he was a young man, Kites used to breed in numbers in a large wood near Canterbury. He stated that whenever he mounted to a nest he always, if possible, climbed first above it, in order to examine the contents, having once incautiously placed his hand among some half-killed snakes and vipers, which had been brought for food, and still retained sufficient life to hiss and strike at him. I should not have mentioned this circumstance had I not seen "reptiles and carrion" recorded in several works as forming part of the food of these birds; and, as but few of these writers appeared to have had much chance of personally observing the habits of the birds, I conclude that their partiality for such repulsive delicacies must have been given on the authority of continental naturalists. The British Kite of the present day, however, appears to be far more refined in its taste. In nests I have myself examined, I have found a few Squirrels and Rabbits, numbers of Grouse and Peewits, and on several occasions the young of Curlews, Ducks, and Pigeons. Grouse seem to be their favourite food. The last nest I had the chance of observing I passed several times, and on every occasion the young birds had a fresh-killed Grouse in the nest. The old birds usually have some particular spot to which they carry their prey, to

partially pluck and break up before taking to the young; sometimes it is a stump of a tree, a large moss-covered stone, or a bare mound of earth; at other times, if the immediate neighbourhood of the nest is covered with long or coarse undergrowth, they prepare the food on the branches of a tree. A few years ago, in the South of Scotland, I had a good view of a female Kite tearing a Peewit within fifteen yards of where I was concealed. She was evidently aware that something was wrong. Settling first on one branch, then on another, she kept constantly turning her head, with all the feathers erect like an owl, in every direction, now and then spitefully snatching a few feathers or a portion of flesh from the unfortunate bird. At last, before approaching the nest, she appeared to have discovered my presence; and, dropping the prey, she mounted into the air, and continued flying in circles for over three hours, uttering the whole time the most melancholy and monotonous cries. Occasionally she would swoop down to within twenty yards of my covering of branches, and hover over the spot, evidently attempting to make out what was concealed. As there appeared no chance of the old lady settling again—my object was to study the actions of the bird—I left my hiding-place, when she immediately rose in the air to a great height, and sailed out of sight. I have noticed that a Kite seldom approaches within 150 or 200 yards when anyone is in the immediate neighbourhood of their nest. From having frequently watched the young birds in the nest, I have noticed that while they believe themselves unobserved, and the old birds are absent, they appear of an inquiring and lively disposition; stretching their necks to the fullest extent, they peep and pry in all directions, shuffle round the nest, snapping at the flies and midges, and frequently spreading and flapping their wings. Before, however, the first cry of the approaching old bird is heard, they drop flat on their breasts; then, lowering their heads and throwing up the feathers on their backs, they patiently await the arrival of their food. The incessant calls of the old bird are occasionally answered by a low plaintive whistle. I have observed the same habits with young birds of this species that I have reared in captivity—lively when they imagined themselves alone, and sulky and shy when anyone was present; they, however, become more sociable as they grow older. Their disposition appears to be totally different to that of young Peregrines and Ospreys. In addition to the place where they prepare the food for their young (and which I have heard keepers style "the Kite's dressing-table"), I believe that these birds, like Grey Crows, occasionally have some spot to which they carry their prey to consume at their leisure. I once counted the remains of over thirty Grouse under the branches of a large fir; some were only bleached and weather-beaten skeletons, and probably had lain for many months. This stock could hardly have been brought together for the benefit of the young, as the nest of the pair of birds frequenting the tree was within the distance

of a hundred yards, and contained only eggs at the time I discovered the remains of the Grouse. Mr. Cordeaux has described the persecution of the game-preservers, which has driven this species from his district, as "senseless." For my own part I should hardly consider a Kite a desirable resident in a game preserve. I can find no accurate description of the habits of our British Kite in any book to which I have access. The authors in nearly every instance copy one from the other. I know of no bird—not even the Roseate Tern or Goosander—that fades and loses its beauty to a greater extent than the Kite. The young, when it first breaks the shell has a long tuft of white hair on the head; this soon gives place to down. The eyes when first opened are dark hazel. By the time the bird is full feathered the iris becomes a pale neutral tint or dirty lavender. I mention this fact as a ponderous work in my possession gives the immature bird the same coloured eyes as the adult.—E. T. BOOTH (Brighton).

HYBRID PHEASANT AND BLACKCOCK.—On the 29th October I detected, among other game in the Plymouth Market, a hybrid between the common Pheasant and Blackcock, which had been killed a few days previously, I believe on the borders of Dartmoor. It was a young male bird, but inferior in size to an ordinary cock Pheasant, and in full moult, especially about the head and neck. Had it been allowed to live a month longer it would have been in magnificent plumage. As it is, the head and greater part of the neck resemble those of a young Pheasant, rather light in colour, but the breast and lower parts of a beautiful glossy black, with violet reflections. The wings and upper part of the back are darker than those of an ordinary Pheasant, and the general markings more freckled; the lower back and rump clouded with violet-black, similar to that on the breast; tail in shape very like that of a hen Pheasant, but not so long, altogether darker and not so distinctly barred; under tail-coverts, rusty red. In form the bird resembles the Pheasant more than the Grouse, and is very like the Shropshire specimen figured by Eyton and Yarrell, but shows the usual white spot at the insertion of the wing so observable in the Black Grouse. There is some naked skin about the eyes; the tarsi and toes are bare, with the exception of some down-like feathers just appearing in front, extending a little below the knee; thighs fully feathered. The contents of the stomach were seeds of the blackberry and wild rose, mixed with the husks of oats, a few insects, and a large quantity of gravel. I had the skin preserved and the body cooked, which proved excellent.—JOHN GATCOMBE (Durnford Street, Stonehouse).

WILDFOWL IN WEST CUMBERLAND.—On the 14th December last I saw on Wastwater three small ducks, which were evidently strangers, but was unable to identify them by moonlight. In the course of a week they were all shot, and one of them was sent to me, and proved to be a Tufted Duck;

the tuft on the head was very small. They were shy, and could only be approached while they dived. The gunner told me they remained under water for fully a minute. On the 23rd a female Goldeneye was sent to me. It was shot by one of Lord Muncaster's keepers on the River Irt, in Drizy parish. It was alone, and had been feeding upon sandhoppers. In October last I saw a Great Northern Diver on Wastwater, and have been told to-day (January 6th) it is still about the lake, though it has been frequently fired at.—CHARLES A. PARKER (Gosforth, Carnforth).

GREAT PLOVER OR THICK-KNEE AT THE SCILLY ISLES.—During the last heavy frost in West Cornwall and the Scilly Isles we had the usual immigration of large flocks of land birds, comprising the Thrush tribe, Larks, Finches, and other of our small birds. I have not been able to ascertain that any rare species of note occurred, and the only bird of interest that has come under my notice from the Scilly Isles is a good-plumaged specimen of the Great Plover or Thick-knee. This bird, as I have before remarked, seems to hold a line in its autumnal migration which just takes in the South of Cornwall and the Scilly Isles. I never knew the occurrence of this bird in Cornwall except in the winter months, its spring migration taking it just as much north above the latitude of Cornwall. Thus the species, although well known in Hampshire and Wiltshire, and spoken of by White in his 'Selborne,' is never seen or heard in the summer months in Cornwall.—EDWARD HEARLE RODD (Penzance).

BRITISH NEWTS.—From an article by M. Ferrand Lataste, in the last volume of the 'Journal of the Société Zoologique de France,' it appears that the supposed fourth species of British Newt, Gray's Banded Newt, *Ommatotriton vittatus* of Cooke's 'Reptiles,' may be altogether removed from the British Catalogue. It was first introduced into the British List by Jenyns, 1835, on the faith of some specimens found in a bottle in the British Museum by the late Dr. Gray, which, being associated with some British Newts, were supposed to have been obtained in the neighbourhood of London. Through a somewhat similar error, some specimens in the collection of the Jardin des Plantes at Paris were believed by Valenciennes to have been obtained in France, near Toul, and other examples were supposed to have been found living at Antwerp. It has thus come to pass that naturalists, copying one from another, have assigned England, France, and Belgium as the locality of this Newt. It now turns out from M. Lataste's researches that all these localities are erroneous, and that the so-called *Triton vittatus* is no other than the *Triton ophryticus* of Berthold, an Eastern species of Newt which is found in Syria and Asia Minor. The British Newts are now therefore reduced to three in number:—the

Crested Newt, *Triton cristatus*, the Smooth Newt, *Triton taniatus* (both of ordinary occurrence), and the rarer Palmated Newt, *Triton palmatus*.—*'Nature,'* 28th Nov. 1878.

LARGE PILCHARD.—On December 28th I measured the largest Pilchard I ever saw. It was in a salted condition, and it may therefore when fresh have been a little longer and not quite so deep as I found it. It measured eleven inches and six-eighths over all in length, and two inches and three-eighths in depth. These measurements will be found to be those of a large Herring. I did not, of course, weigh the specimen. It was one of a mixed lot of English and Irish fish, so that I cannot determine the place of its occurrence.—THOMAS CORNISH (Penzance).

VITAL TENACITY OF *Succinea putris*.—I forward a few specimens of a small form of the Amber Snail, *Succinea putris*. The chief interest lies in a peculiar habit which I have observed in the species. During the warmer months the usual habitat of this little mollusk is a sluggish watercourse, which conveys water from the reclaimed meadows above. At the outlet there is a flood-gate to prevent the ingress of sea-water. The colony of *Succinea* resides at the water's edge, a few yards *below* the flood-gate. The only molluscos companion is a finely striated small var. of *Ancylus fluviatilis*. During the *neap-tides*, both species live undisturbed in fresh water; but in the *spring-tides* they are subjected for a few hours, night and day, to a brisk influx of salt-water. *Ancylus* is a permanent resident,—attached to submerged stones; but *Succinea* is migratory. I revisited the locality on the 4th of November. Not a single specimen of *Succinea* was to be found at the water-side. Within a few yards of the ditch runs a mortar-built wall of limestone, about five feet high, and coped with stones set edgewise, at short intervals. On searching the wall for small species of land-shells I was surprised to find the colony of *Succinea*, alive and active, in small groups at the bases of the copings; some were concealed beneath moss, others under pieces of mortar. The locality was again visited on the 29th November, but there was not a *Succinea* on the wall; and its hybernaculum is a mystery. The specimens now sent were taken from the wall on the 4th of November, and subjected to a rigid experiment. They were enclosed without water, in the dry glass tube, wherein they were kept on a warm mantelpiece till this morning (December 9th). They were then transferred to a jar of fresh water. In half-an-hour the liberated prisoners were crawling up the sides of the jar, some attempting to escape.—THOS. GOUGH (Arnbarrow, Milnthorpe).

DEATH OF THE MARQUIS OF TWEEDDALE.—By the death of the Marquis of Tweeddale, which occurred at Chiselhurst on December 29th, zoological science has sustained a sad loss. Having only succeeded to the peerage on the death of his father so recently as October, 1876, his lordship was perhaps better known to naturalists as Viscount Walden, under which name he published numerous valuable contributions to Ornithology in the 'Transactions' and 'Proceedings' of the Zoological Society, in the 'Ibis,' the 'Annals and Magazine of Natural Society,' and other journals devoted to Natural History. Amongst his later publications may be specially mentioned his contributions to the Ornithology of the Philippines, which have appeared at intervals in the 'Transactions' above mentioned. Having passed some time in India, where he acquired his taste for Ornithology, and possessing a considerable knowledge of the Asiatic avifauna, his lordship had been occupied for some time before his death in investigating the Ornithology of the Philippines, until then comparatively little known. Friends and agents in this group of islands furnished him at intervals with large collections of bird-skins, and these he described in a series of valuable papers, illustrated with coloured plates of the new and rare species. It was no secret amongst ornithologists, we believe, that for some years past Lord Tweeddale had been engaged in collecting materials for a history of the birds of India, for which undertaking Jerdon's valuable work had paved the way, and furnished, as it were, the skeleton or groundwork; and, unless we are mistaken, considerable progress had been made with the MS. at the time of his lordship's lamented decease. As another instance of his devotion to the cause of his favourite science, we may mention the warm interest which he took in the publication of Mr. Dresser's 'Birds of Europe,' and the important aid which he furnished to that work in preparing a considerable portion of the synonymy. His valuable zoological library and large collections of birds at Chiselhurst were always available for inspection by his naturalist friends, to whom he was ever ready to impart information when required. Working thus energetically himself, and assisting and encouraging others to work also, Lord Tweeddale, as President of the Zoological Society, was emphatically "the right man in the right place." He was a Fellow of the Royal and Linnean Societies, and a distinguished member of the British Ornithologists' Union, to whose quarterly journal, 'The Ibis,' he contributed many valuable articles. His loss will be much felt by a large circle of naturalists and men of science, to say nothing of the numerous private friends by whom he was surrounded. His death, at the age of fifty-five, was occasioned, we are informed, by a combined attack of bronchitis and congestion of the lungs.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

December 19, 1878.—Prof. ALLMAN, F.R.S., President, in the chair.

Messrs. F. M. Campbell (Hoddesdon, Herts), J. Laurence Hamilton (Gloucester Terrace, Hyde Park), and J. J. MacAndrew (Ivybridge, South Devon), were elected Fellows of the Society.

A short paper consisting of a description of some rare shells by Mr. Sylvanus Hanley was read. *Melania Limborgi*, from British India, and *Leptomya gravida*, of uncertain habitat, were specially referred to as being unusual in several respects.

The President made a verbal communication "On the Relations of *Rhabdopleura*," expressing the opinion that the very anomalous characters of this curious Polyzoal genus admit of being derived from the typical conformation of a polyzoon by certain easily understood modifications. One of the most puzzling of those characters is the apparent absence of an endocyst, which necessarily brings with it the absence of a tentacular sheath. He pointed out that the endocyst is really represented by the contractile cord, which seems to take the place of the funiculus in the freshwater Polyzoa, but with which it has nothing to do. In *Rhabdopleura* the endocyst has receded from the ectocyst, and in its posterior part by the approximation of its walls, and the consequent nearly complete obliteration of its cavity has become changed into the contractile cord. Anteriorly it spreads over the alimentary canal of the polypide to which it becomes closely adherent, and here represents the tentacular sheath. Still more posteriorly the endocyst undergoes even greater modification, for the contractile cord becomes chitinized and converted into the firm rod which runs through the stem and branches over all the older parts of the colony, and which still presents in its narrow lumen a trace of the original cavity of the endocyst. The shield-like appendage which is attached to the lophophore is one of the most remarkable features in the genus. G. O. Sars regards it as representing the epistome of the Phylactolæmatous Polyzoa; but this view is entirely opposed by the history of its development. Prof. Allman, by tracing its development in connexion with that of the polypide, has arrived at the conclusion that it is formed as a primary bud, from the modified endocyst, and that in its turn it gives origin to a bud of the second order, which becomes directly developed into the definitive polypide. The primary or scutiform bud continues for some time to increase in size with the developing polypide, which it considerably exceeds, but is at last surpassed by the latter. It never disappears, however, but ultimately remains in the condition of a subordinate appendage of the polypide to which it had given origin. We have thus in the life-history of *Rhabdopleura* an alternation of heteromorphic zooids. The first term, however, in

the genetic series, the direct product of the sexual system, is as yet wanting, no trace of this system having hitherto been discovered in *Rhabdopleura*.

January 16, 1879.—W. CARRUTHERS, F.R.S., Vice-President, in the chair.

Messrs. George Brooke (Huddersfield), Arthur Pearce Luff (Marylebone), John Edward Griffiths (Bangor), Charles Sharpe (Liverpool), and John Woodland (Kilburn Park), were balloted for and duly elected Fellows of the Society.

No zoological communications were made at this meeting, but the following botanical memoir was read, viz.:—"A Synopsis of *Colchicaceæ* and the aberrant Tribes of *Liliaceæ*," by J. G. Baker.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

January 14, 1879.—Professor NEWTON, M.A., F.R.S., Vice-President, in the chair.

Before proceeding to the usual business the Chairman called attention to the great loss which the Society and Zoological Science had sustained by the recent death of their late President, the Marquis of Tweeddale, F.R.S.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of December, 1878, and called special attention to a collection of Lemurs brought to England by Mr. George A. Shaw from the province of Betsileo, in Central Madagascar, and acquired by the Society partly by purchase and partly by presentation; and to a female Punjab Wild Sheep, *Ovis cycloceros*, presented by Colonel W. R. Alexander, having been obtained in the hills between Upper Sind and Beloochistan.

Dr. Traquair exhibited a specimen of the Hackled Pigeon, *Alectanas nitidissima*, recognised last September in the Museum of Science and Art in Edinburgh, by Professor Newton, who made some remarks on the species, showing that it was peculiar to Mauritius; that it is now wholly extinct; and that only three specimens of it are known to have been preserved.

The Secretary read an extract from a letter received from Commander Hoskins, R.N., of H.M.S. 'Wolverine,' on the subject of the range of the Mooruk, stating that no traces of the existence of this bird could be found in New Ireland. An extract was also read from a letter, addressed to the Secretary by the Rev. George Brown, giving additional particulars on the same subject.

The Secretary read an extract from a letter addressed to him by Mr. R. Trimen, of Cape Town, on the subject of the true locality of the

Black Spurwinged Goose, *Plectropterus niger*, which he had ascertained had been brought to Cape Town from Zanzibar.

A communication was read from Dr. Morrison Watson and Dr. Alfred H. Young on the anatomy of the Spotted Hyæna, *Hyæna crocuta*.

A communication was read from Mr. A. D. Bartlett, giving an account of the habits and changes of plumage of Humboldt's Penguin, as observed in a specimen which had been recently living in the Society's Gardens.

A communication was read from Dr. O. Finsch, containing an account of a collection of birds, made by Mr. Huebner on Duke of York Island and New Britain.

A communication was read from Mr. Edward J. Miers, describing a collection of Crustacea, made by Capt. H. C. St. John, R.N., in the Korean and Japanese Seas. The present paper related to the Podophthalmia of the collection, of which groups twenty-six species were described as apparently new to science.

A communication was read from Count T. Salvadori, containing critical remarks on Mr. Elliot's paper on the Fruit Pigeons of the genus *Ptilopus*, lately published in the Society's 'Proceedings.'

A communication was read from the late Marquis of Tweeddale, containing the twelfth of a series of contributions on the Ornithology of the Philippines. The present paper gave an account of the collections made by Mr. A. H. Everett in the Island of Basilan.

Dr. A. Günther gave an account of the Mammals, Reptiles and Batrachians recently collected by Mr. Everett in the Philippine Islands, and called special attention to a new form of Snake of the family *Calamariidæ*, of which one example had been obtained. This Snake, which was remarkable as possessing no external rudiments of eyes, was proposed to be called *Typhlogeophis brevis*. —P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

December 4, 1878. — H. W. BATES, Esq., F.L.S., F.Z.S., President, in the chair.

Mr. T. P. Newman, of 7, York Grove, Peckham, was ballotted for and elected a Member. Mr. J. Walker, R.N., of Blue Town, Sheerness, was ballotted for and elected a Subscriber.

Mr. H. T. Stainton exhibited a series of fine specimens of *Glyphipteryx Schænicolella* taken by Mr. Threlfall near Witherslack last summer. They were flying over cotton-grass in little swarms just before sunset—literally by hundreds—and were mistaken at the time for *G. Fischeriella*. The species was first recorded by Mr. Thomas Boyd in the 'Entomologists' Weekly Intelligencer,' vol. iv., p. 144.

Mr. Wood-Mason exhibited and made remarks upon a stridulating beetle belonging to the *Rutelidæ*.

Prof. Westwood exhibited a male specimen of *Epinephele Tithonus* having the right hind-wing much paler than the general ground colour of the other wings; likewise a variety (gynandromorphic) of *E. Jurtina*, viz., a male specimen, having the under side of the left hind-wing partly male and partly female in character, the two portions being separated by an orange streak, and presenting the appearance of a male wing with a portion of a female wing let in. An enlarged coloured diagram of the last insect was exhibited, and also similar diagrams of the following specimens:—(1). A male *Porrhybris Pyrrha* (from Mr. Hewitson's collection) having the under side of the right hind-wing coloured like the female, which mimics a species of *Heliconia*. (2). A specimen of *Nymphalis Populi* with larval head. (3). A specimen of *Dytiscus marginalis* (original in British Museum) with larval head, and one of *Helophilus pendulus* similarly deformed, two specimens of this last example of imperfect development being in the Hope Collection at Oxford.

Prof. Westwood remarked with regard to monstrosities that although in such cases among the higher animals the head parts often appeared duplicated, this very rarely appeared among the Arthropoda. He was inclined to regard gynandromorphism as the result of the coalescence of two ova in the female insect, and the subsequent suppression of all the characters of the one sex but those retained in the imago.

Mr. H. T. Stainton raised the question whether many cases of gynandromorphism might not be explained by atavism, *i.e.*, by partial reversion to ancestral characters.

Mr. M'Lachlan exhibited a series of cases of the larvæ of Trichopterous insects forwarded to him by Dr. Fritz Müller, of Blumenau, Santa Catharina, Brazil. Several of the forms, of minute size, were evidently those of *Hydroptilidæ*.

Dr. Fritz Müller also sent enlarged outlines of the neururation of various Lepidoptera, in order to point out the homologies that appeared to exist with that of the Trichoptera, of which an outline of the wing of *Glyphidotaulius*, copied from Kolenati's 'Genera et Species Trichopterorum,' was placed side by side with those of the Lepidoptera. Mr. M'Lachlan called especial attention to the neururation of *Castnia Ardalus* as delineated by Dr. Müller, and compared it with that of *Hydropsyche* as figured in his 'Revision and Synopsis of European Trichoptera.' He stated that it had long been his opinion that in a linear arrangement the orders Lepidoptera and Trichoptera should not be widely separated.

The Rev. A. Eaton exhibited a piece of "Kungu cake" from Lake Nyassa. According to Livingstone and others this substance is used extensively as food in the region referred to, and is made by the natives of large quantities of a minute insect, whose habit is to fly in dense cloud-like flights often similar in appearance to columns of smoke. These subsiding

upon the herbage along the borders of the lake, accumulate to a considerable depth, and are then collected *en masse*, pressed into cakes, and dried for consumption. Until now the "Kungu fly" has been conjectured to be a species of the *Ephemeridæ*; but on actual inspection it proves to be a minute representative of the *Culicidæ*, and (so far as can be ascertained from the material at hand) of the genus *Corethra*. The condition of the compressed examples precludes an exact determination of the species being made from them. It is possible that "Kungu cake" in other localities may be composed of other materials.

Mr. W. L. Distant remarked that he had learnt from Mr. Chennell that *Erthesina fullo*, a very common Eastern Hemipterous insect, was largely eaten by the Naga Hill tribes of N E. India.

Mr. Meldola stated that while on the subject of insect-food he would mention that Mr. S. Stevens had forwarded to him a query by Mr. J. Watson respecting the chemical composition of the bodies of insects, which, since they furnish all the materials necessary for the food of those birds which, like swallows, feed on the wing, must contain, in addition to carbon, hydrogen, and oxygen, the requisite nitrogen and phosphates. Mr. Meldola remarked that chitine, the substance composing the horny external portions of the bodies of insects, had been shown by analysis to contain about 6 per cent. of nitrogen. With regard to phosphates he stated that, although he was sure the ash of the bodies of insects did contain these salts, he was unable to find any direct statement to this effect, and at his request, therefore, Mr. William Cole had been good enough to burn some insects, and to test the ash for phosphoric acid, which he had succeeded in finding.

Mr. C. O. Waterhouse forwarded for exhibition a living *Curculio* found by Mr. J. C. Bowring in his orchid-house at Windsor. The insect was identified by Mr. Pascoe and Professor Westwood as one of the *Calandridæ*.

The Secretary read the "Report of the Sub-Committee appointed to consider the communication from the Board of Trade, dated 2nd November, 1878, regarding the ravages of *Anisoplia austriaca* at Taganrog."

Mr. A. G. Butler communicated a paper "On a collection of Lepidoptera from Cachar, N.E. India."

Annual Meeting, January 15, 1879.—H. W. BATES, F.L.S., President, in the chair.

Mr. J. W. Dunning, one of the Auditors, read an abstract of the Treasurer's Accounts for 1878, showing a balance of £30 14s. 7d. in favour of the Society.

The Secretary read the Report of the Council for 1878.

Mr. M'Lachlan proposed and Mr. Wood-Mason seconded the adoption

of the Council's Report. The motion was put to the Meeting and carried unanimously.

An address was delivered by the President.

Sir Sidney Saunders and Mr. E. Boscher were appointed scrutineers.

The following Members of Council were elected for 1879:—Henry Walter Bates, F.L.S., F.Z.S.; William L. Distant; Rev. A.E. Eaton, M.A.; Edward A. Fitch; Ferdinand Grut, F.L.S.; Raphael Meldola, F.C.S.; Edward Saunders, F.L.S.; Frederick Smith; J. Jenner Weir, F.L.S., F.Z.S.; Joseph W. Dunning, M.A., F.L.S.; Sir John Lubbock, Bart., M.P., V.P.R.S.; Samuel Stevens; James Wood-Mason, F.G.S.

The following officers were then elected:—President, Sir John Lubbock, Bart., M.P.; Treasurer, J. Jenner Weir; Librarian, F. Grut; Secretaries, R. Meldola and W. L. Distant.

Mr. H. T. Stainton proposed a vote of thanks to the President for his services during the past year, and moved that his address should be printed. The motion was seconded by Mr. M'Lachlan, and carried unanimously.

A vote of thanks to the other officers for their services was proposed by Mr. J. W. May, seconded by Mr. Pascoe, and carried unanimously. Messrs. Jenner Weir, Grut, Meldola, and Distant replied.

The President returned thanks to the Auditors, on whose behalf Mr. Dunning replied, and the Meeting then adjourned to February 5th.—
R. MELDOLA, *Hon. Secretary.*

NOTICES OF NEW BOOKS.

The Fenland Past and Present. By SAMUEL H. MILLER, F.R.A.S., F.M.S., Medallist and Foreign Member of the Society of Arts and Sciences of Utrecht; and SYDNEY B. J. SKERTCHLY, F.G.S., Her Majesty's Geological Survey. Illustrated with Engravings, Maps and Diagrams. Wisbech: Leach & Son. London: Longmans. 1878. Royal 8vo.

Now that in these days when "men run to and fro upon the earth, and knowledge is increased," the aspect of few parts of England is not more or less known to our readers. A gloomier prospect is hardly to be viewed by a traveller than that which presents itself to the eyes of the ordinary passengers on certain portions of the Great Northern or Great Eastern Railways, where the line runs over the Fen Country. The ground is a dead level; the soil black; hedgerows, and still more the graceful elms which in so many parts of the kingdom embellish them, are wholly

wanting. Field is separated from field by ditches half-choked with weeds. The horizon is broken only by straggling plantations of alders and black poplars. A few willows here and there cluster in a corner which seems to have escaped the attention of the agriculturist. As we come to a halt at one of those lonely stations—

“Where none but a Great Eastern train would stop,
Where there's no one to pick up and no one to drop”—

we marvel how people can be found to dwell in the midst of such a melancholy district. In spring or early summer, indeed, our ears may catch the chattering notes of the Sedge-bird or the feeble song of the Reed Sparrow, but at all other seasons of the year silence reigns; and the traveller, if he be passing through the country for the first time, wonders whether he may have inhaled the germs of an ague, and whether the stories he may have heard as to the opium-consuming habits indulged in by the Fen men to prevent that dire malady are true or not. Such are probably the thoughts presented to ninety-nine out of every hundred even intelligent passengers through a considerable portion of Huntingdonshire, Lincolnshire, Cambridgeshire and Norfolk. But the one man out of the hundred will know that the landscape he views was not always as he sees it, and that its present condition has been brought about at an expense of money and life and labour which no one can compute, and that it may be regarded as one of the greatest triumphs of the human intellect over the concurrent forces of nature—for has he not read Mr. Smiles's ‘Lives of the Engineers’?

It is impossible to doubt the fact that this wide expanse, so unlovely, so repulsive—we may almost say—in its present state, was once an absolute paradise, abounding in animal life and diversified by vegetation, the nature of which we can hardly conceive. Yet if we turn to what is recorded of its earlier condition we find but little to satisfy our longings for information, and we must say that that little has not been made the most of by the authors of the book which has prompted these remarks. They have, it is true, and we are much obliged to them for it, given on the whole a fairly accurate, and in some respects a happy, paraphrase of that curious passage in the ‘Liber Eliensis,’ wherein a monk of the twelfth century depicted some of the principal features of the fen country of his time, and we may add that this is the

more to their credit, since the passage is in some parts extremely hard to translate. They quote it entire (pp. 356—358), with only two or three trifling misprints, but it deserves to be better known than it is, and we will here attempt an English version of it. We may state that it is an enconium passed upon the Isle of Ely, and supposed to have been delivered to William the Conqueror when he was laying siege to that "Camp of Refuge";—the last portion of England which held out against his victorious arms:—

"In our isle men are not troubling themselves about the leaguer, but think they may safely be defended by their tiros; the ploughman has not taken his hand from the plough, nor has the hunter cast aside his arrow, nor does the fowler desist from beguiling birds. And yet something more. If you wish to hear what I have known and have seen, I will reveal all to you. The isle is within itself plentifully endowed, it is supplied with various kinds of herbage, and for its richer soil surpasses the rest of England. Most delightful for its charming fields and pastures, it is also remarkable for its beasts of chase, and is in no ordinary way fertile in flocks and herds. Its woods and vineyards are not worthy of equal praise, but it is beset by great meres and fens as though by a strong wall. In this isle there is an abundance of domestic cattle and a multitude of wild animals; Stags, Roes, Goats and Hares are found in its groves and by these fens. Moreover, there is a fair plenty of Otters, Weasels and Polecats, which in a hard winter are caught by traps, snares, or by any other device. But what am I to say of the kind of fishes, and of fowls, both those that fly and those that swim? In the eddy at the sluices of these meres are netted innumerable Eels, large Water-wolves—even Pickerels, Perches, Roaches, Burbot and Lampreys, which we call Water-snakes. It is indeed said by many men that sometimes *Isicii*,*

* It seems impossible at present to say what fish is here meant, though our authors translate it "Shad." The resemblance of the word to *isicium* (a pudding or sausage) points to some kind which was commonly made into a pudding or cooked with stuffing, and Du Cange has *Isix* = *Esox*—i. e., according to the ordinary interpretation, a Pike. Now, though to this day a Pike is generally baked with "a pudding in his belly," following the laudable example of Izaak Walton, Pike can hardly be intended in the text, for it has been already named among the commonest fishes, whereas the *Isicii* were comparatively rare. Du Cange translates *Esox* by *Alose*—the French for Shad, and our authors seem to have followed him; but we submit that their interpretation cannot be allowed. In the first place, the old name of the Shad is *Lachia*, whence comes *Alachia*, *Alausa*, *Alose*, and *Allice*, &c. (Yarrell, 'British Fishes,' ed. 3, vol. i., p. 128); and, secondly, no British species of Shad is possessed of such qualities as would justify its being mentioned in the exceptional way that the *Isicii* are. We may add that there can be no question of a wrong reading, as we are assured by Mr. J. W. Clark, who has kindly consulted on this point the original MS. in the library of Trinity College, Cambridge. The

together with the royal fish, the Sturgeon,* are taken. As to fowls, let us, if it be not troublesome to you, recount those which abide there and thereabout, as we have done with the rest. There are numberless Geese, *Fiscedula*,† Coots, Didappers, Water-crows, Herons and Ducks, of which the number is very great. At midwinter or when the birds moult their quills, I have seen them caught by the hundred, and even by three hundreds more or less, sometimes they are taken in nets and snares as well as by bird-lime."†

Want of space forbids our attempting to fill up the outlines thus boldly sketched, and thus we must look in vain for another glimpse of fen zoology till we find one, of all places in the world, in the 'Ephemerides' of Casaubon, a foreigner and a scholar! This distinguished man, in 1611, accompanied Andrews, then Bishop of Ely, on a visit to part of his diocese, and the journal kept, as was his wont, shows what a remarkably acute observer he must have been. As Mr. Pattison, the editor of an excellent memoir of him ('Isaac Casaubon, 1559—1614'), says, "In this summer retreat [Downham Market], Casaubon enjoyed forty-eight days of peace and leisure. . . . The flat fen of Donnington is not a favourable specimen of our rural scenery, but Casaubon thought it beautiful, coming from S. Mary Axe. Though he had lived at Montpellier, he thought the apricots of the Isle of Ely rivalled those of France in flavour. He was struck with the wealthy appearance of the country. He saw something of provincial life, accompanying the Bishop on a progress or visitation, which he made to Wisbech and the neighbourhood." We will hazard another translation, of an entry made at Wisbech, on the 20th September of that year:—

historian, however, in copying from some older record (a practice not confined to monkish annalists) may have written the word wrongly, and we cannot help suggesting that there has been a corruption of some such word as *leaxas*, which would signify Salmon, possibly through this very *Lachia*.

* The word in the original is *Rumbus*, which, in its usual form of *Rhombus*, undoubtedly signifies Turbot, as our authors have translated it. But what could a Turbot be doing in the fresh waters of the Isle of Ely? The expletive of "the royal fish" points to the Sturgeon, and in the 'Promptorium Parvulorum' (the work, be it remembered, of an East Anglian) we find (Ed. Way, p. 481) "Sturione, or Sturiowne, fysche (sturgyn, K. sturiowne or storyon, S.) *Rumbus*." We therefore do not hesitate to accept this rendering here, and may remark that there are many cases of the name of an animal being diverted from its common meaning by mediæval authors.

† In the translation of this word there is again a difficulty. The most obvious suggestions are that it is a corruption of *Piscedula* or *Ficedula*; but no such name as the former is known, and the latter, "Fig-eaters," seems strangely out of place in such company. Could we read it *Querquedula*, Teals, all would be easy.

‡ Lib. ii. cap. 105 (Ed. D. J. Stewart, 1848).

"We also saw certain choice birds which are fattened for sale. Amongst the rest one called Godwit, that is to say, *Dei ingenium*, which is wonderfully commended, so that at Wisbech, where provisions are very cheap, the bird-feeder said he sold these birds for five or six English halfpence (*solidis*)—equal to fifty or sixty French—apiece, but when he took them to London he brought back twenty English pence for each. The bird is the size of a small Partridge, or even less. Its colour is grey, and it has a bill longer than my middle finger stretched out. The flesh when cooked is dark as is that of marsh-birds. I ate it at the Lord Bishop's table, and did not think highly of it: I do not see the reason why it is so greatly preferred to the *Otus*."*

What this *Otus* was may be discovered from another passage in the same journal:—

"*Blitteræ aves. Oti vel Otides.*

"In the Ely country there is a bird about as big as a hen, in colour a mixture of yellow and grey, &c., having very long legs, and called *Blitterra*. It is said to be in the habit of introducing its bill into one of the nearest reeds, and of thundering forth a voice so horrible that those unused to the thing say it is that of an evil spirit, and so loud that two gentlemen assured me it could be heard for three or four miles. It is not agreeable meat.

"The *Otus* or *Otis*, indeed, is a bird less than a Partridge, and a mimic, wont to be beguiled and caught by silly imitation. Great men and kings are keen in the chase of this bird. It furnishes very delicate meat, if my palate is sufficiently instructed. I have also seen them alive. They say that if the fowler lifts one of his feet the bird does the same, if he extends an arm the bird extends a wing, and imitates all his actions."†

The *Blitterra* is, of course, the Bittern, and the fable of its booming, "with bill engulphed," is a very old one, perpetuated even by Thomson in the last century, though Drayton, in the extract from his 'Polyolbion' (written about this time), which our authors most properly quote (pp. 367, 368), seems to have been superior to it. But the *Otus* or *Otis* of Casaubon, as every ornithologist will perceive, cannot be anything else than the Dotterel,‡ and his statement as to its capture by kings is curiously corroborated by what we know from another source to have been one of the "sports" of James I. in the preceding year, for which we must

* 'Ephemerides Isaaci Casauboni,' &c. (Ed. Jon. Russell, ii., pp. 867, 868).

† *Op. cit.*, p. 873.

‡ Mr. Pattison, not being an ornithologist, naturally falls into the mistake of thinking it was a Bustard (*op. cit.* p. 391). We may also remark that for the same reason Mr. Russell in the penultimate passage prints "Godwie" for "Godwit," thereby failing to explain Casaubon's ingenious Latin translation of its name.

refer our readers to Mr. Stevenson's 'Birds of Norfolk' (vol. ii., pp. 82—84), as we have not room to quote it here.

We have just mentioned Drayton's 'Polyolbion,' which gives as animated a picture as well can be of Fen life*—but then again we come to another lamentable blank. The observant Ray, who lived so long on the borders of the district, and, as his 'Itineraries' show, more than once traversed it, has left us no connected account of its peculiarities, and what can be gathered from his and Willughby's writings leads us to suppose they had never made any special study of them. There is perhaps one reason for the neglect with which the Fens in their best time were treated, though we are not aware of its having been alleged before, and as it is strictly a zoological matter we may mention it now. They were doubtless most abominably infested by clouds of gnats, from which visitors would suffer torments. This is no mere supposition. We have the evidence of the younger Thomas Browne to this effect. In his tour from Norwich to Derbyshire and further, in 1662, he had occasion to cross the Wash from Lynn to Boston, and he mentions two routes. Of that which he took he writes that it was "not troubled with flies with which all those fenne countrey's are extreemly pestered."†

What would we not give to have had from that prince of faunists, Gilbert White, an account of the Fenland during his stay in it? We have long known his opinion:—"I have often thought that those vast extent of fens have never been sufficiently explored. If half-a-dozen gentlemen, furnished with a good strength of water-spaniels, were to beat them over for a week, they would certainly find more species."‡ And he had good right to give an opinion, since we learn from that interesting correspondence of his with Marsham which has only of late years been published,§ that in 1746 he "lived for six months at Thorney, in

* One especially remarkable feature is prominently brought forward in the line:—

"There stalks the stately *Crane*, as though he march'd in warre,"

reminding us of old Turner's earlier statement (in 1544):—"Apud Anglos etiam nidulantur grues in locis palustribus, & earum pipiones sæpissime vidi, quod quidam extra Angliam nati, falsum esse contendunt." Had this writer lived till the year 1878 he might have found an Englishman taking the same mistaken view (*Athenæum*, No. 2625, p. 222).

† Sir Thomas Browne's Works, &c., edited by Simon Wilkin, vol. i., p. 23.

‡ Letter xxii. to Pennant.

§ Trans. Norf. and Norw. Nat. Society, ii. p. 152.

the Isle of Ely,"* and we know besides that in the month of June in that year he "was visiting for a week together at Spalding;"† but, alas! the only information he gives us on the fauna of the Fens is the bare statement that "there are supposed to be two sorts of eels in the island of Ely."‡

By far the best picture of the Fens known to us is that drawn by White's correspondent, Pennant, whose labours it is now-a-days rather the fashion to depreciate. He visited Lincolnshire at least three times:—first in May, 1768, when he met Mr. (afterwards Sir Joseph) Banks at Revesby Abbey, the latter's seat in that county, and "made many observations on the zoology of the country;"§ secondly, from the 27th to the 29th of June, 1769, when he rode from Chesterfield by Dunham Ferry and the Foss Dyke to Lincoln, whence he visited Spalding, and, passing near Swinesland Abbey, returned to Lincoln, proceeding northward by Glanford Bridge to the Humber;|| and thirdly, in July, 1776, when he went from Lincoln by Horncastle, Tattershall, Boston, Crowland and Castor to Peterborough.¶ In his account of the second of these visits occurs a description, which, being unknown probably to most of our readers, and not mentioned by the authors of 'The Fenland,' we take the liberty of reproducing. It probably includes the experience of both his earlier visits:—

"The fen called the *West Fen*, is the place where the Ruffs and Reeves resort to in the greatest numbers; and many other sorts of water-fowl, which do not require the shelter of reeds or rushes, migrate here to breed; for this fen is very bare, having been imperfectly drained by narrow canals, which intersect it for great numbers of miles. These the inhabitants navigate in most diminutive shallow boats; they are, in fact, the roads of the country.

"The *East Fen* is quite in a state of nature, and gives a specimen of the country before the introduction of drainage: it is a vast tract of morass, intermixed with numbers of lakes** from half a mile to two or three miles

* The circumstance which induced this statement is also mentioned in his 'Antiquities,' Letter v.

+ Letter xxiii. to Pennant.

‡ Letter xl. to Pennant.

§ 'Literary Life,' p. 8. Among these observations must have been those on the heronry at Cressi, which so excited White's curiosity, and on the supposed new *Locustella*, as it was called in those days, the Sedge Warbler of modern times, the recognition of which is due to White and Pennant jointly.

|| 'Tour in Scotland,' Ed. 5, i. pp. 7—15.

¶ 'Literary Life,' p. 24.

** Our authors give (p. 150) a list of these lakes and their names from Dugdale.

in circuit, communicating with each other by narrow reedy straits: they are very shallow, none are above four or five feet in depth; but abound with fish, such as Pike, Perch, Ruff, Bream, Tench, Rud, Dace, Roach, Burbot, Sticklebacks, and Eels.

"It is observable that, once in seven or eight years, immense shoals of Sticklebacks appear in the Welland below Spalding, and attempt coming up the river in form of a vast column. They are supposed to be the collected multitudes washed out of the fens by the floods of several years, and carried into some deep hole; when, over-charged with numbers, they are obliged to attempt a change of place. They move up the river in such quantities as to enable a man, who was employed in taking them, to earn, for a considerable time four shillings a day, by selling them at a halfpenny per bushel. They were used to manure land, and attempts have been made to get oil from them. The fen is covered with reeds, the harvest of the neighboring inhabitants, who mow them annually; for they prove a much better thatch than straw, and not only cottages, but many very good houses are covered with them. Stares, which during winter resort in myriads to roost in the reeds, are very destructive, by breaking them down by the vast numbers that perch on them. The people are therefore very diligent in their attempts to drive them away, and are at great expense in powder to free themselves of these troublesome guests. I have seen a stack of reeds harvested and stacked worth two or three hundred pounds, which was the property of a single farmer.

"The birds which inhabit the different fens are very numerous: I never met with a finer field for the zoologist to range in. Besides the common Wild-duck, of which an account is given in another place,* wild Geese, Garganics, Pochards, Shovelers, and Teals, breed here. I have seen in the *East Fen* a small flock of the tufted Ducks; but they seemed to make it only a baiting place. The Pewit Gulls and black Terns abound; the last, in vast flocks, almost deafen one with their clamors: a few of the great Terns, or Tickets, are seen among them. I saw several of the great crested Grebes on the *East Fen*, called there *Gaunts*, and met with one of their floating nests with eggs in it. The lesser crested Grebe, the black and dusky Grebe, and the little Grebe, are also inhabitants of the fens; together with Coots, Waterhens, spotted Waterhens, Water-rails, Ruffs, Redshanks, Lapwings or Wipes, Red-breasted Godwits and Whimbrels. The Godwits breed near Washenbrough; the Whimbrels only appear for about a fortnight in May near Spalding, and then quit the country. Opposite to Fosdyke Wash, during the summer, are great numbers of *Arosettas*, called there *Yelpers*, from their cry. They hover over the sportsman's head like the Lapwing, and fly with their necks and legs extended.

* 'British Zoology,' ii., No. 279.

"Knots are taken in nets along the shores near Fosdyke in great numbers during winter; but they disappear in the spring."*

More follows on the Short-eared Owl and the Cressi heronry, but nothing that is novel, and we need not quote further.

Early in the present century Montagu made a tour through Lincolnshire, with the special object of studying the natural history of the Ruff, and though he says little or nothing of the Fens generally, the account of that species given in his 'Supplement' will always remain a classic passage to the ornithologist, and must be well known to our readers. It is indeed greatly to be regretted that he and Pennant had not more imitators. Numerous collectors no doubt visited one part or another of the Fen country, and some of them were able observers; but, alas! whether ornithologists or entomologists, they have left very scant records of what they saw. These records, however, are well worth hunting up, and since our authors have not been at this trouble, there is an opening for some Fenland faunist here to do good work.

The desire to lay before our readers these overlooked passages, which Messrs. Miller and Skertchly might well have introduced into their work, has led us to such a length that we find ourselves compelled to be very brief in our criticisms of it; but in what we have said, and in what remains for us to say, we strictly limit ourselves to the scope of this present journal, and so we at once dismiss the archaeology, the history and antiquities, the geology, the meteorology, and the botany of this bulky volume. All these subjects may be admirably treated for anything we know to the contrary, though the geological teaching laid down has been declared by a contemporary ('Nature,' xviii., p. 514) to be somewhat questionable, if not actually heretical. We cannot even review the entomological portion, and we must confine ourselves to that part which has to do with Vertebrates—the most interesting probably to the readers of 'The Zoologist.' This then

* Gough, in his edition of Camden's 'Britannia,' inserts a condensed version of this interesting description, and the few writers who have ever alluded to it at all have generally credited him with it as the result of his own observation, if they have not laid it to Camden. There can be no doubt that the authorship is due to Pennant, who indeed tells us (Lit. Life, p. 37) that to Gough he communicated several of his manuscript journals, and moreover mentions that returning from his third visit to Lincolnshire he passed a day with Gough at Enfield (*ibid.* p. 24). Gough was a respectable topographer and antiquarian, but no naturalist. He, however, showed his good sense by incorporating into his work these remarkable passages.

leaves us only chapters eleven and twelve—the former by Mr. Skertchly, and the latter apparently by Mr. Miller.

Mr. Skertchly's account of the prehistoric fauna of the district seems to us unnecessarily diffuse. Though he says, "it would be going beyond our limits to enlarge upon the fossils preserved to us in the ancient strata which underlie the true fen beds," this is exactly what he has done, or why do we have disquisitions on the fauna of various "gravels" containing remains of Elephant,* Hippopotamus, Rhinoceros and other forms which most assuredly passed away long before the Fens, in the ordinary acceptation of the term, existed? The fauna of the Fenland really begins with what we find in the peat—or the "moor," to use the local name for it. Here he names seventeen mammals, including Man, and a "variety" of *Bos longifrons*! This last is, of course only a domesticated breed of Ox, and we cannot doubt that the Horse also was in like condition, while possibly the same may be said of the Goat and of the normal Long-fronted Ox. This would leave only a dozen species undisputed; but we venture to question the existence when the peat began to form of the Rein-Deer, and think that its remains must be referred to a preceding epoch. The Wolf, the Marten, the Bear, the Beaver, the Boar, all the *Cervidæ* and the *Urus* are now extinct in the district, if not in Britain—and thus the fauna of the early peat days and that of our own would seem to have only two *wild* mammals in common, the Fox and the Otter—but of course a greater number of the smaller British quadrupeds must then have lived, and we know that remains of the Polecat, omitted by Mr. Skertchly, have been found. The authors have done well to introduce a figure of the grand and nearly perfect skeleton of the *Urus* dug up a few years since in Burwell Fen, and now one of the glories of the Cambridge Museum, for it has not been figured before, and is the only specimen approaching to completeness in the kingdom. The same Museum also possesses a nearly perfect skeleton, perhaps unique, of the British Beaver. Mr. Skertchly enumerates but seven species of birds:—the Coot, Bittern, Pelican, Wild and Tame Swan, Teal and Crested Grebe. We can assure him, however, that the traces of several other species, as the Heron and Wild

* At page 335 he goes out of his way to say that three years ago it was reported that a herd of Mammoths had been seen in Siberia, though he does add, "the rumour, however, has never been verified"

Duck, have also been recognized. However, none of these possess much interest except the Pelican, the discovery of which was altogether unexpected. Only two bones of it have been recognized,* and, curiously enough, each of them is a humerus *from the same side of the bird!* M. Alphonse Milne-Edwards has shown that one of them, though of large size, was that of a young bird; hence it may not be unfairly inferred that the species bred in the district. Mr. Skertchly includes the Water Tortoise, but the only remains known to have been found in England were not discovered actually within the limits of the Fens, though in truth not many miles away.

In his account of the modern fauna, the writer, whom we take to be Mr. Miller, hardly rises to his interesting subject. Concerning its earlier condition we have already said enough in quoting and remarking on the extracts above given. In the list of existing mammals (pp. 358—362) we find a few statements that seem to be strange; for instance, Mr. Jenyns's *Plecotus brevimanus* was not "supposed by the author to be a variety of" *P. auritus*, but was described by him as a distinct species, though it is now generally recognized as the young of the Long-eared Bat. In his views as to Shrews, Mr. Miller is strangely at variance with Prof. Bell, for in his last edition we find there but three species given as British, whereas Mr. Miller will have four for the Fens. Nor is the latter happy in his nomenclature, for he calls one of them *Sorex hibernicus!* Had he taken the trouble to refer to Mr. Jenyns's published paper, he would have found this last name to have been given to a supposed variety, from Ireland, of Mr. Jenyns's *S. rusticus*, which is a Fen animal, no doubt, but has been identified in Mr. Bell's last edition (p. 148 a) with *S. pygmaeus*. In the same work Mr. Bell united *S. remifer* with *S. fodiens*, and there can be little doubt that he was right in so doing; thus Mr. Miller's fourth species of Fen Shrew comes to nothing.†

* Proc. Zool. Soc., 1868, p. 2; 1871, p. 702.

† In mentioning the British Shrews we cannot refrain from expressing our regret that Prof. Bell, or, as we suppose, Mr. Tomes, who assisted him in the *Insectivora*, has given up the old name of *Sorex araneus* for the common Shrew, in favour of *S. vulgaris*. The latter was bestowed by Linnæus in 1754, and he, in 1766,—the date from which all binomial nomenclature in Zoology starts,—replaced it by the far better known *araneus*. No doubt some foreign naturalists have applied this specific designation to a perfectly distinct species, but their misuse does not invalidate the proper use of it by Linnæus.

We also hesitate to believe that the Marten, the Seal, and the Black Rat have any right to be included in the list of existing mammals, to swell which Mr. Miller liberally adds four species of *Arvicola*, one of which is *A. arvalis*, altogether unknown to Britain, while he counts *A. rubidus* and *A. riparia* as distinct.

So far as the Birds are concerned the less said the better. It is true that Mr. Miller has been assisted by some notes by Mr. Cordeaux, which, as would be expected of him, are much to the point; but that gentleman, so far as we are aware, has never made an especial study of the Fen district (in which he does not reside), and naturally would not be supposed to have much to say of its avian peculiarities. Anything more meagre than the rest of the information which Mr. Miller furnishes cannot well be imagined. A three-legged Rook shot in the district and preserved in the Wisbech Museum is honoured by one of his notes. In another the Turtle Dove is pronounced to be only a very occasional visitant—but it is needless to dwell upon remarks of this kind. To the ornithologist they are of no use, to the general reader they are misleading. We had looked in such a work as this for a full and detailed account of the remarkable history of Savi's Warbler,—a bird which was only discovered to be a British denizen just as its last retreat was being destroyed,—but all we find given is its name and a note (furnished by Mr. Cordeaux) containing a quotation that we certainly cannot complain of, but one that never professed to give a history of the species. Of the Fishes the list seems better by far, but here Mr. Miller has had the assistance of Dr. John Lowe, who has before shown himself to be a competent ichthyologist.

It remains for us to say that the present work weighs four pounds six ounces, that it contains, besides the preface, contents, and so forth, 649 pages of excellent paper, and is sumptuously bound. It has a very fair map, several very respectable illustrations—the frontispiece excepted—but a wretched index and more misprints than it has been our bad luck to encounter for a long time.



